

## ENVIRONMENTAL PARAMETERS AND SEASONAL SUCCESSION OF PLANKTONIC BIOMASS IN THE RIVER GOMATI OF GARHWAL AND KUMAUN OF UTTARAKHAND, INDIA

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### ABSTRACT

In tropical region, vertical sun light provides maximum penetration of light in the water. High temperature and strong radiation are thus the main factors in the tropical areas which are responsible for the growth of phytoplankton. In different water bodies various physio-chemical factor have been studies and have often been correlated with phytoplankton growth.

**Key words:** Gomati, Physico-chemistry, plankton biomass.

### INTRODUCTION

The Gomati is one of the most important rivers of Garhwal and Kumoun Himalaya hills. It is a spring-fed river, originated from Angyari (Chamoli District) (latitudes 26'5" and longitudes 62<sup>o</sup>), elevation about 2540 masl.

The species composition, distribution and abundance of plankton chemical and physical properties of water. This paper described the planktons in relation to physical and chemical parameter of the river Gomti.

### MATERIAL AND METHODS

Water samples were taken fortnightly. Four sampling stations at the distance of 1000 m. were selected for the study. Standard techniques (Anonyous, 1975, Welch, 1948) were followed to determine the physico-chemical factors of the Gomti. Velocity of water was measured by an electro magnetic current meter, while the discharge of the water was ascertained by "sample segment method", the air and water temperature was recorded by an ordinary centigrade thermometer. The pH was measured by an Elico pH meter.

Observation on the physio-chemical parameter of different water bodies have revealed that nutrient level plays an important role in regulating the growth, succession and distribution of planktonic biomass.

The water temperature of Gomati follows the same trend as that observed for air temperature except from June to August when an inverse relationship was observed, due to snow melting. The dissolved Oxygen (DO) showed two distinct seasons one of the March and other in November. The increase in DO content during early summer occurs due to increase photosynthetic activity of algae. The increase in DO content during the winter was due to physical aeration rather than biological events. The low DO values during the summer occur because of the loss of O<sub>2</sub> from water and respiratory activities of heterotrophs. While the depletion in DO contents in the monsoon was due to increase of turbidity. A negligible amount of free CO<sub>2</sub> was observed in Gomti only in some part of the year.

The pH values did not show any marked fluctuation and were alkaline throughout the year. Dobriyal (1983) also found similar pattern of pH value in the river Mandakini and Nayar. The pH showed a positive relationship with total alkalinity, which was mainly due to bicarbonate as carbonate were present in low amount, hydroxide were always absent throughout the year. After a sharp fall during March to June the total hardness showed a tendency of rise from July onwards. This was possibly due to the fact that from February onwards the river received a large quantity of ion free water after ice melt, from July to February. The increase in hardness was mainly due to addition of rain water and surface runoff introduced to the river. Similar observations have been made by Jana and Das (1980) and Bisht (1993). Therefore the SO<sub>4</sub> contents increased gradually from August and become maximum in November, which was due to refurbishing of the biota as the Sulphate is contributed to the natural water from biotic source (Moyle, 1949).

Among the different group of plankton, Bacillariophyceae occupies the first place as also observed by Nautiyal (1985) in the river Alaknanda. Decompus *et al* (1984) observed that in Lot River of the Europe over 90% of the plankton consisted of diatoms and green algae.

There is considerable difference of opinion regarding the effect of pH on phytoplankton, Mc Combie (1953) suggested that the high pH value are the result of significant growth of phytoplankton, while George (1962) opined that the high pH value promote the growth of phytoplankton.

Thus it may be concluded that the variations in physio chemical and meteorological parameters are responsible for the fluctuation in the quality and quantity of the plankton and other biota of the Gomati.

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